SyncMaster 923NW / 2023 NW / 2223NW

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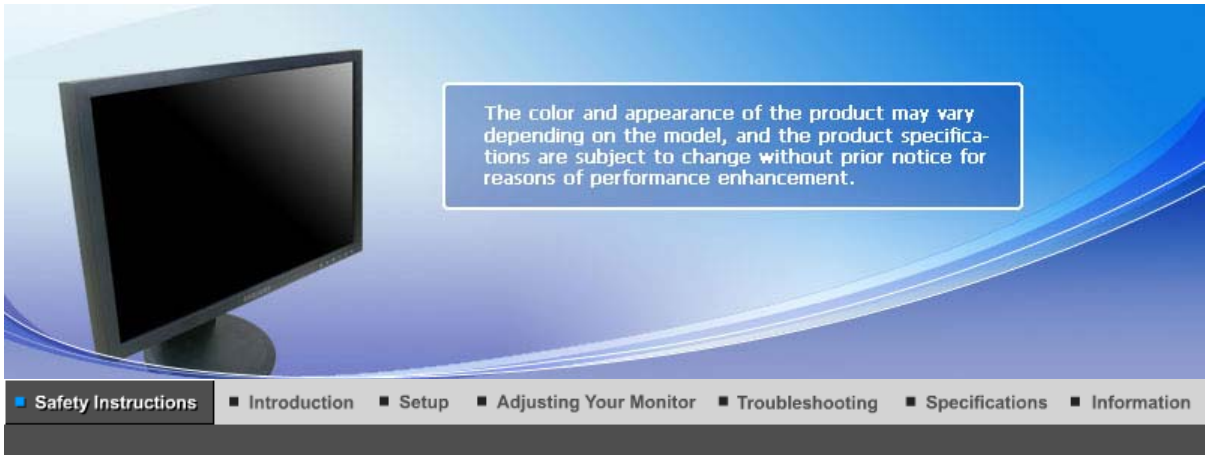
The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.
Safety Instructions
Introduction
Setup
Adjusting Your Monitor
Troubleshooting
Specifications
Information

Notational

These safety instructions must be followed to ensure your safety and prevent property damage.
Make sure to read the instructions carefully and use the product in the correct manner.

Warning / Caution

Otherwise, it may result in death or personal injury.

Otherwise, it may result in personal injury or property damage.

Notational Conventions

Prohibited

Important to read and understand at all times

Do not disassemble

Disconnect the plug from the outlet

Do not touch

Ground to prevent an electric shock

Power

When not used for extended period of time, set your computer to DPM.

If using screen saver, set it to active screen mode.

The images here are for reference only, and are not applicable in all cases (or countries).

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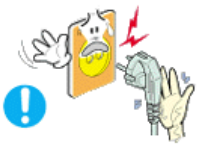
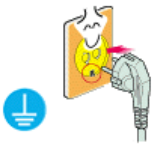
Shortcut to Anti-Afterimage Instructions

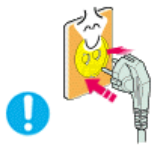
- **Do not use a damaged power cord or plug or a damaged or loose power outlet.**
  - Otherwise, this may result in electric shock or fire.



- **Do not touch the power plug with wet hands when removing or plugging the plug into the outlet.**
  - Otherwise, this may result in electric shock.

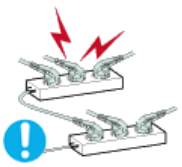


- **Make sure to connect the power cord to a grounded power outlet.**
  - Otherwise, it may result in electric shock or personal injury.



- **Ensure that the power plug is plugged into the power outlet firmly and correctly.**
  - Otherwise, this may result in fire.

- **Do not forcefully bend or pull the power plug and do not place any heavy material on it.**
  - Otherwise, this may result in fire.



- **Do not connect multiple appliances to the same power outlet.**
  - Otherwise, this may cause fire due to overheating.

- **Do not disconnect the power cord while using the product.**
  - Otherwise, this may result in damage to the product due to electric shock.

- To disconnect the apparatus from the mains, the plug must be pulled out from the mains socket, therefore the mains plug shall be readily operable.
  - This may cause electric shock or fire.

- **Use only the power cord provided by our company. Do not use the provided power cord of another product.**
  - Otherwise, this may result in fire or electric shock.

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Installation

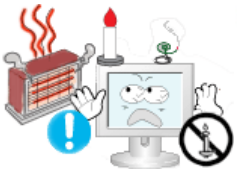
Be sure to contact an authorized Service Center when installing your monitor in a location with heavy dust, high or low temperatures, high humidity, and exposed to chemical substances and where it operates for 24 hours such as at airports, train stations etc.

Failure to do so may cause serious damage to your monitor.

- **Do not drop the monitor when moving it.**
  - This may cause damage to the product or the person carrying it.

- **Ensure that at least two persons lift and move the product.**
  - Otherwise, it may be dropped and cause personal injury, and/or damage the product.

- **When installing the product in a cabinet or rack, make sure that the front end of the bottom of the product does not project out.**
  - Otherwise, it may fall or cause personal injury.
  - Use a cabinet or rack of a size appropriate to the product.



- **DO NOT PLACE CANDLES, MOSQUITO REPELLANT, CIGARETTES AND ANY HEATING APPLIANCES NEAR THE PRODUCT.**
  - Otherwise, this may result in fire.

- **Keep heating appliances as far away from the power cord or the product as possible.**
  - Otherwise, this may result in electric shock or fire.

- **Do not install it in a badly ventilated location such as a bookcase or closet.**
  - Otherwise, this may result in fire due to an increase in the internal temperature.

- **Put down the monitor carefully.**
  - Failing to do so may damage the monitor.

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- **Do not place the front of the product on the floor.**
  - Otherwise, this may result in damage to the screen display.

- **Ensure that an authorized installation company installs the wall mount.**
  - Otherwise, it may fall and cause personal injury.
  - Make sure to install the specified wall mount.

- **Install your product in a well ventilated location. Ensure that there is a clearance of more than 10 cm from the wall.**
  - Otherwise, it may result in fire due to an increase in the internal temperature.

- **Ensure that the packaging vinyl is kept away from children.**
  - Otherwise, it may result in serious harm (suffocation) if children play with it.

- **If the height of your monitor is adjustable, do not place any object or part of your body on the stand when lowering it.**
  - This may cause damage to the product or the person carrying it.

Clean

When cleaning the monitor case or the surface of the TFT-LCD screen, wipe with a slightly moistened and soft fabric.

- **Do not spray cleaner directly onto the surface of the product.**
  - Otherwise, this may result in the discoloration and distortion of the structure and the screen surface may peel off.

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- **Clean the product using a soft cloth with a monitor cleaner only. If you must use a cleaner other than the monitor cleaner, dilute it with water at a ratio of 1:10.**

- **When cleaning the power plug pins or dusting the power outlet, clean it with a dry cloth.**
  - Otherwise, it may result in fire.

- **When cleaning the product, make sure to disconnect the power cord.**
  - Otherwise, it may result in electric shock or fire.

- **When cleaning the product, disconnect the power cord and clean it softly with a dry cloth.**
  - (Do not use chemicals such as wax, benzene, alcohol, thinner, mosquito repellant, lubricant, or cleaner.) These may change the appearance of the product surface and peel off the indication labels on the product.

- **Since the product housing is easily scratched, make sure to use the specified cloth only.**
  - Use the specified cloth adding only a little water. As the product may be scratched if there is any foreign material on the cloth, make sure to shake it thoroughly before using it.

- **When cleaning the product, do not spray water directly onto the main body of the product.**
  - Ensure that water does not enter the product and that it is not wet.
  - Otherwise, this may result in electric shock, fire or a malfunction.

Others

- **The product is a high voltage product. Ensure that users do not disassemble, repair or modify the product themselves.**
  - Otherwise, this may result in electric shock or fire. If the product needs to be repaired, contact a Service Center.

- **If there is a strange smell or a strange sound or smoke is coming from the product, disconnect the power plug immediately and contact a Service Center.**
  - Otherwise, this may result in electric shock or fire.

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- **Do not place this product in a location exposed to moisture, dust, smoke, water, or in a car.**
  - Otherwise, this may result in electric shock or fire.

- **When you drop the product or the case is broken, turn the power off and disconnect the power cord. Contact a Service Center.**
  - Otherwise, this may result in electric shock or fire.

- **If thunder or lightening is occurring, do not touch the power cord or antenna cable.**
  - Otherwise, this may result in electric shock or fire.

- **Do not try to move the monitor by pulling only the wire or the signal cable.**
  - Otherwise, it may fall and result in electric shock, damage to the product or fire due to damage to the cable.

- **Do not lift or move the product back and forwards or right and left while only holding the power cord or signal cables.**
  - Otherwise, it may fall and result in electric shock, damage to the product or fire due to damage to the cable.

- **Make sure that the ventilating opening is not blocked by a table or curtain.**
  - Otherwise, it may result in fire due to an increase in the internal temperature.

- **Do not place any containers containing water, vases, flowerpots, medicines as well as any metal on the product.**
  - If water or a foreign material enters the product, disconnect the power cord and contact a Service Center.
  - This may result in a product malfunction, electric shock, or fire.

- **Do not use or keep combustible spray or flammable material near the product.**
  - Otherwise, this may result in an explosion or fire.

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- **Do not insert any metal, such as chopsticks, coins, pins and steels, or inflammable objects, such as matches or paper, inside the product (through the ventilating openings, input and output terminals, etc).**
  - If water or foreign material enters the product, disconnect the power cord and contact a Service Center.
  - Otherwise, this may result in electric shock or fire.

- **When using a fixed screen for a long time, an afterimage or stain may occur.**
  - If you are not using your product for a long period of time, put it into sleep mode or use a moving screen saver.

- **Set a resolution and frequency appropriate to the product.**
  - Otherwise, your eyesight may be damaged.

- **If you continually move closer to the product screen, your eyesight may be failing.**

- **To ease eye strain, take at least a five-minute break after every hour of using the monitor.**

- **Do not install it in an unstable location such as an unstable rack or uneven surface or a location exposed to vibrations.**
  - Otherwise, it may fall and cause personal injury and/or damage the product.
  - If you use the product in a location exposed to vibrations, it may damage the product and result in fire.

- **When moving the product, turn the power off and disconnect the power plug, antenna cable, and all the cables connected to the product.**
  - Otherwise, it may result in electric shock or fire.

- **Ensure that children do not hang onto the product or climb up onto the product.**
  - The product may fall and cause personal injury or death.

- **If you do not use the product for a long period of time, disconnect the power cord from the power outlet.**
  - Otherwise, this may result in overheating or fire due to dust, and may result in fire due to electric shock or leakage.

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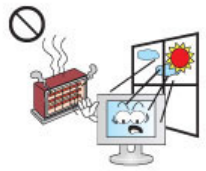
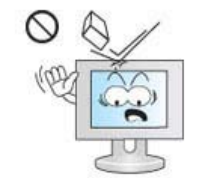
- **Do not place any heavy items or toys or confectionery, such as cookies etc. that may attract the attentions of children onto the product.**
  - Your children may hang onto the product causing it to fall and this may result in personal injury or death.

- **Do not turn the product upside down or move it while holding only the stand.**
  - Otherwise, it may fall and result in personal injury and/or damage to the product.



- **Do not place the product in a location exposed to direct sunlight or near any heat such as a fire or heater.**
  - This may reduce the lifetime of the product, and may result in fire.



- **Do not drop any objects onto the product or cause any impact to the product.**
  - Otherwise, this may result in electric shock or fire.

- **Do not use a humidifier or kitchen table near the product.**
  - Otherwise, this may result in electric shock or fire.

- **When there is a gas leak, do not touch the product or the power plug but ventilate immediately.**
  - If a spark occurs, it may cause an explosion or fire.

- **If the product has been turned on for a long time, the display panel becomes hot. Do not touch it.**
  - Keep the small accessories in a location out of the reach of children.

- **Be careful when adjusting the angle of the product or the height of the stand.**
  - This may result in personal injury as your hand or fingers may become caught.
  - Also, if you tilt the product too far, it may fall and cause personal injury.

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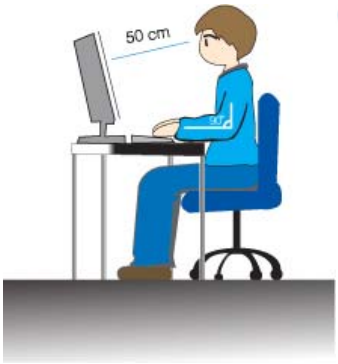
- **Do not install the product in a location low enough for children to reach.**
  - Otherwise, it may fall and result in personal injury.
  - Since the front part of the product is heavy, install the product on a level and stable surface.

- **Do not put any heavy objects on the product.**
  - This may result in personal injury and/or damage to the product.

Good Postures When Using the Monitor



- **When using the product, use it in the correct position.**
  - Keep your back straight while looking at the product.
  - The distance between your eyes and the screen should be between 45 to 50 cm. Look at the screen from a slightly higher location than the height of the screen.
  - When using the product, use it in the correct position.
  - Adjust the angle so that light is not reflected on the screen.
  - Place your arms perpendicular to your sides and allow your arms to be level with the back of the hand.
  - Keep your elbow at 90 degrees.
  - Keep your knees at greater than 90 degrees, and keep your heels firmly on the floor. Keep your arms lower than your heart.

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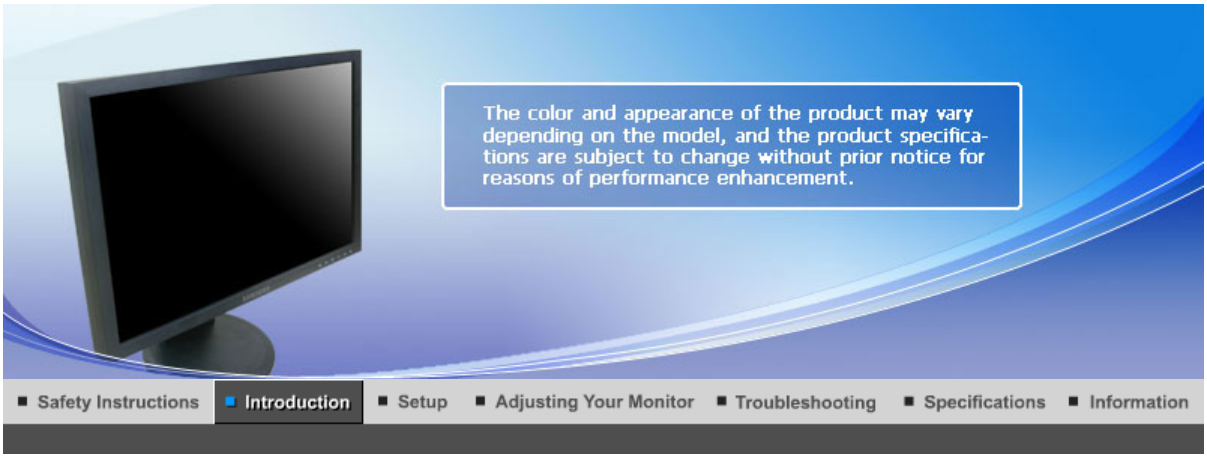
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Safety Instructions
Introduction
Setup
Adjusting Your Monitor
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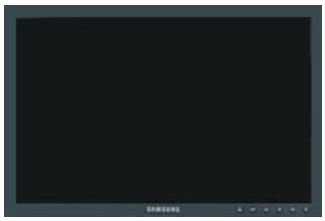
Information

Please make sure the following items are included with your monitor.
If any items are missing, contact your dealer.
Contact a local dealer to buy optional items.

- **Unpacking**
  - **Without stand**



Monitor

  - **With stand**

Monitor & Simple Stand

Bottom

- **Manual**

Quick Setup Guide

Warranty Card/ Registration Card
(Not available in all

User's Guide, Monitor Driver

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locations)

Cable

D-sub Cable

Power Cord

Front

1	**MENU button [▥]**	Opens the OSD menu. Also use to exit the OSD menu or return to the previous menu.
2	**Customized Key [▭]**	You can customize key assignment for the Custom button according to your preferences.
		You can configure the customized key for a required function via **Setup** > **Customized Key**.
3	**Brightness button [☼]**	When OSD is not on the screen, push the button to adjust brightness.
2,3	**Adjust buttons [▼/▲]**	Adjust items in the menu.
4	**Enter button [⏎]**	Activates a highlighted menu item.
5	**AUTO button**	Use this button for auto adjustment.
6	**Power button [⏻]/ Power indicator**	Use this button for turning the monitor on and off./ This light glows blue during normal operation, and blinks blue once as the monitor saves your adjustments.

See PowerSaver described in the manual for further information regarding power saving functions. For energy conservation, turn your monitor OFF when it is not needed, or when

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leaving it unattended for long periods.

Rear

Simple stand

(The configuration at the back of the monitor may vary from product to product.)

1 **POWER port**	Connect the power cord for your monitor to the power port on the back of the monitor.
2 **RGB IN port**	Connect the signal cable to the 15-pin, D-sub port on the back of your monitor.
3 **Kensington Lock**	The Kensington lock is a device used to physically fix the system when using it in a public place. (The locking device has to be purchased separately.) **For using a locking device, contact where you purchase it.**

See Connecting the Monitor for further information regarding cable connections.

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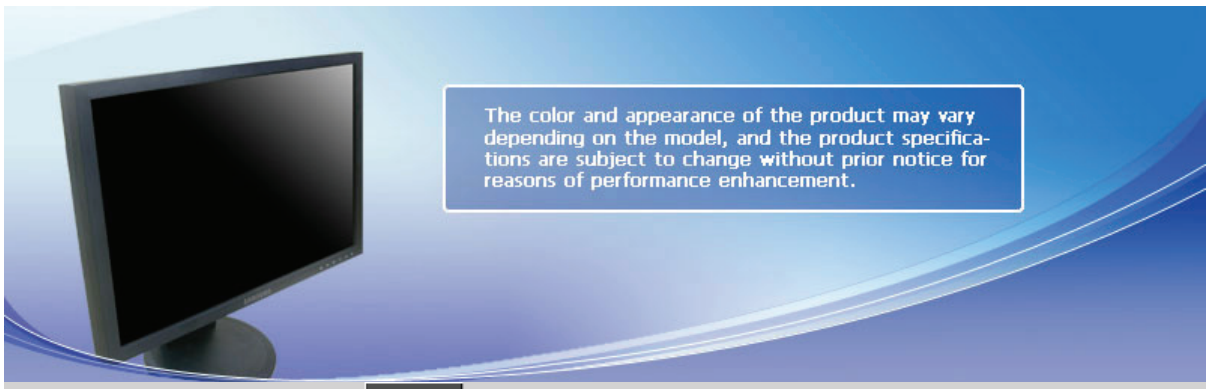
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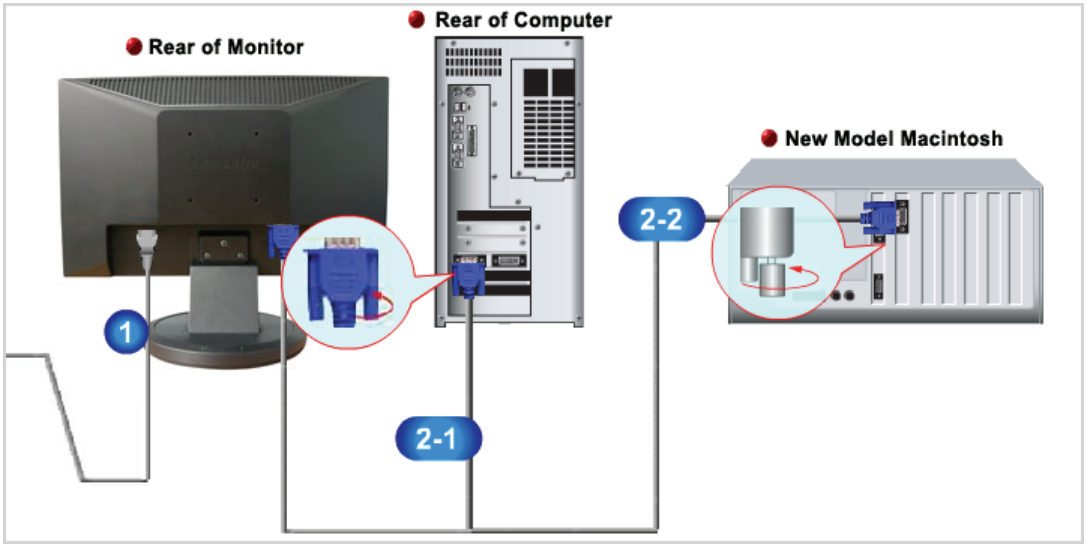
Connecting the Monitor



1. Connect the power cord for your monitor to the power port on the back of the monitor.
   Plug the power cord for the monitor into a nearby outlet.
2. Use appropriate connection for your computer.

   2-1 Using the D-sub (Analog) connector on the video card.
   Connect the signal cable to the 15-pin, D-sub port on the back of your monitor.

   [RGB IN]

   2-2 Connected to a Macintosh.
   Connect the monitor to the Macintosh computer using the D-sub connection cable.

If the monitor and the computer are connected, you can turn them on and use them.

Using the Stand

Monitor Assembly

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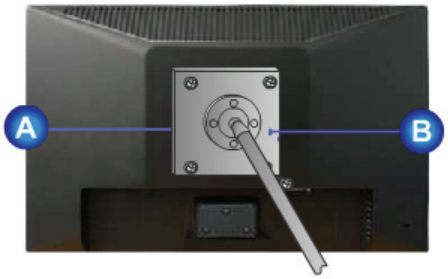
Monitor and Bottom

Attaching a Base

This monitor accepts a 75.0 mm x 75.0 mm VESA-compliant mounting interface pad.



Simple stand

A Monitor

B Mounting interface pad (Sold separately)

1. Turn off your monitor and unplug its power cord.
2. Lay the LCD monitor face-down on a flat surface with a cushion beneath it to protect the screen.
3. Remove four screws and then remove the stand from the LCD monitor.
4. Align the mounting interface pad with the holes in the rear cover mounting Pad and secure it with four screws that came with the arm-type base, wall mount hanger or other base.

- Do not use screws longer than the standard dimension, as they may damage the inside of the Monitor.
- For wall mounts that do not comply with VESA standard screw specifications, the length of the screws may differ depending on their specifications.
- Do not use screws that do not comply with the VESA standard screw specifications.
  Do not fasten the screws too tightly, as this may damage the product or cause the product to fall, leading to personal injury.
  Samsung is not liable for these kinds of accidents.
- Samsung is not liable for product damage or personal injury when a non-VESA or non-specified wall mount is used or the consumer fails to follow the product installation instructions.

- To mount the monitor on a wall, you should purchase the wall mounting kit that allows you to mount the monitor at least 10cm away from the wall surface.
- Contact the nearest Samsung Service Center for more information. Samsung Electronics will

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not be responsible for damages caused by using a base other than those specified.

- **Please use Wall Mount according to the International standards.**

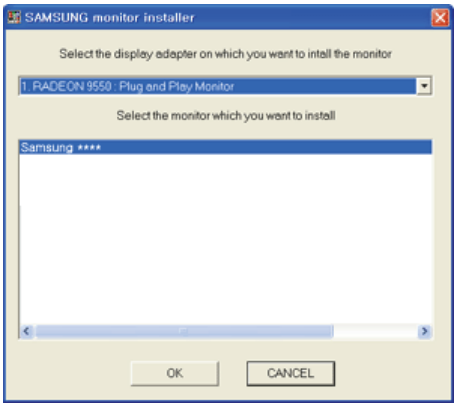
Installing the Monitor Driver (Automatic)

When prompted by the operating system for the monitor driver, insert the CD-ROM included with this monitor. Driver installation is slightly different from one operating system to another. Follow the directions appropriate for the operating system you have.

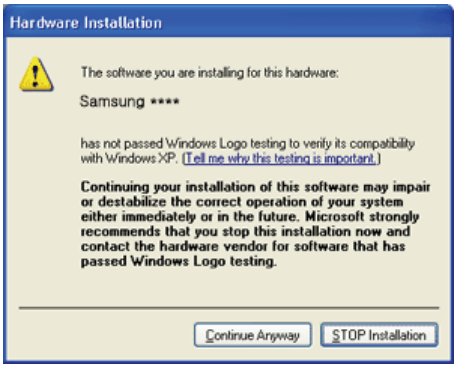
Prepare a blank disk and download the driver program file at the Internet web site shown below.

- Internet web site : http://www.samsung.com/ (Worldwide)
  http://www.samsung.com/monitor (U.S.A)
  http://www.sec.co.kr/monitor (Korea)
  http://www.samsungmonitor.com.cn/ (China)

1. Insert CD into the CD-ROM drive.
2. Click **"Windows"**
3. Choose your monitor model in the model list, then click the **"OK"** button.


SAMSUNG monitor installer
Select the display adapter on which you want to intall the monitor
1. RADEON 9550 : Plug and Play Monitor
Select the monitor which you want to install
Samsung ****
OK
CANCEL

4. If you can see following message window, then click the **"Continue Anyway"** button. Then click **"OK"** button. (Microsoft® Windows® XP Operating System)


Hardware Installation
The software you are installing for this hardware:
Samsung ****
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

This monitor driver is under certifying MS logo,and this installation don't damage your system.The certified driver will be posted on Samsung Monitor homepage http://www.samsung.com/

5. Monitor driver installation is completed.

Installing the Monitor Driver (Manual)

Windows Vista | Windows XP | Windows 2000 | Windows ME | Windows NT | Linux

When prompted by the operating system for the monitor driver, insert the CD-ROM included with this monitor. Driver installation is slightly different from one operating system to another. Follow the directions appropriate for the operating system you have.

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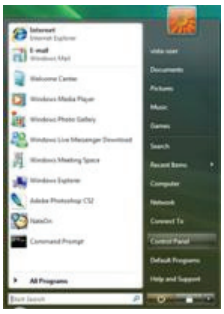
Prepare a blank disk and download the driver program file at the Internet web site shown below.

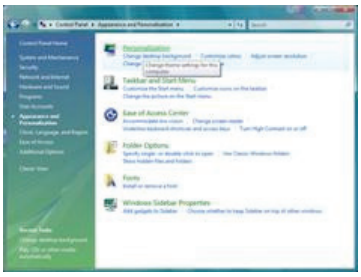
- Internet web site : http://www.samsung.com/ (Worldwide)
  http://www.samsung.com/monitor (U.S.A)
  http://www.sec.co.kr/monitor (Korea)
  http://www.samsungmonitor.com.cn/ (China)

Microsoft® Windows Vista™ Operating System

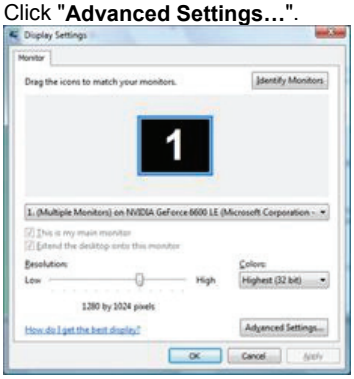
1. Insert your Manual CD into your CD-ROM drive.
2. Click (Start) and "**Control Panel**". Then, double-click on "**Appearance and Personalization**".



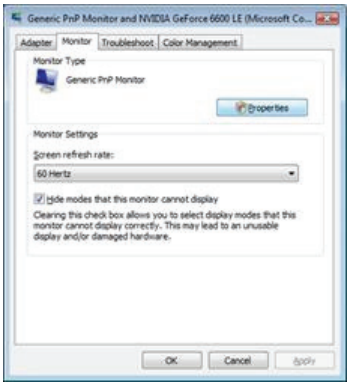
3. Click "**Personalization**" and then "**Display Settings**".



4. Click "**Advanced Settings...**".



5. Click "**Properties**" in the "**Monitor**" tab. If the "**Properties**" button is deactivated, it means the configuration for your monitor is completed. The monitor can be used as is.
   If the message "**Windows needs...**" is displayed, as shown in the figure below, click "**Continue**".


Generic PnP Monitor and NVIDIA GeForce 6600 LE (Microsoft Co...
Adapter
Monitor
Troubleshoot
Color Management
Monitor Type
Generic PnP Monitor
Properties
Monitor Settings
Screen refresh rate:
60 Hertz
Hide modes that this monitor cannot display
Clearing this check box allows you to select display modes that this monitor cannot display correctly. This may lead to an unusable display and/or damaged hardware.
OK
Cancel
Apply

This monitor driver is under certifying MS logo, and this installation doesn't damage your system.
The certified driver will be posted on Samsung Monitor homepage

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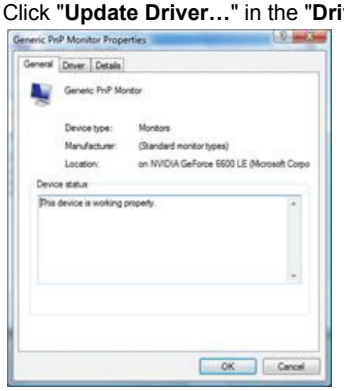
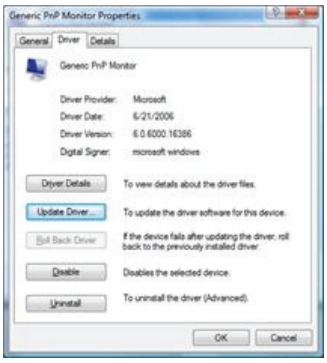
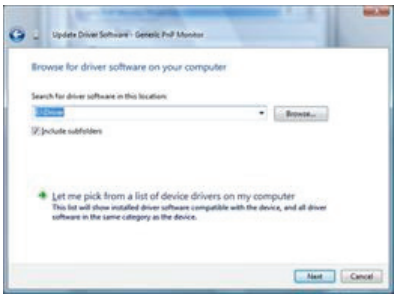
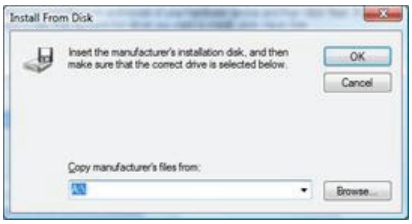
6. Click "**Update Driver…**" in the "**Driver**" tab.

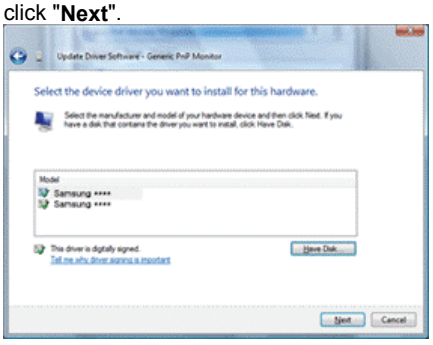
7. Check the "**Browse my computer for driver software**" checkbox and click "**Let me pick from a list of device drivers on my computer**".



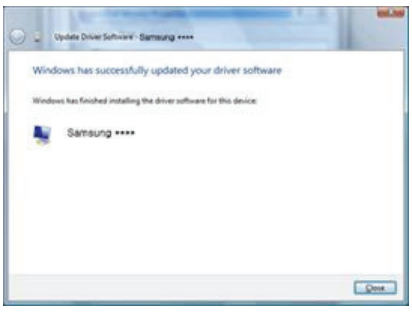
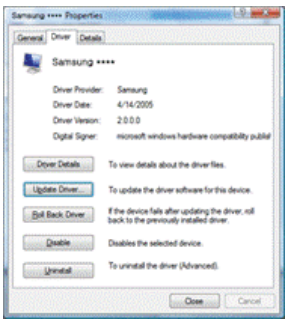
8. Click "**Have Disk…**" and select the folder (for example, D:\Drive) where the driver setup file is located, and click "**OK**".



9. Select the model that matches your monitor from the list of monitor models on the screen, and click "**Next**".



10. Click "**Close**"→ "**Close**" → "**OK**" → "**OK**" on the following screens displayed in sequence.

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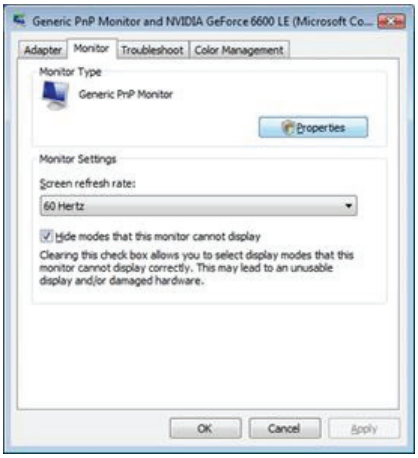
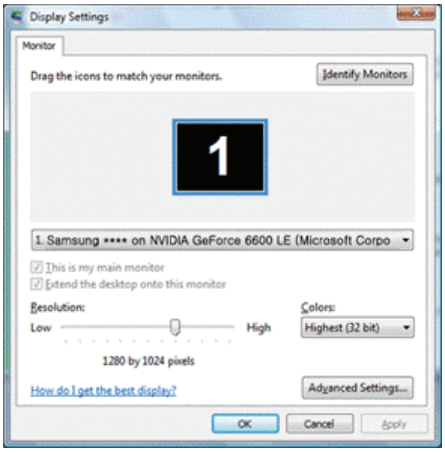
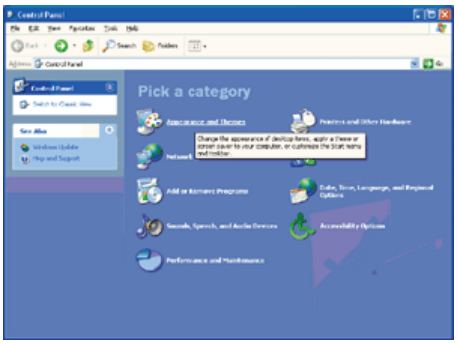

Generic PnP Monitor and NVIDIA GeForce 6600 LE (Microsoft Co...
Adapter
Monitor
Troubleshoot
Color Management
Monitor Type
Generic PnP Monitor
Properties
Monitor Settings
Screen refresh rate:
60 Hertz
Hide modes that this monitor cannot display
Clearing this check box allows you to select display modes that this monitor cannot display correctly. This may lead to an unusable display and/or damaged hardware.
OK
Cancel
Apply

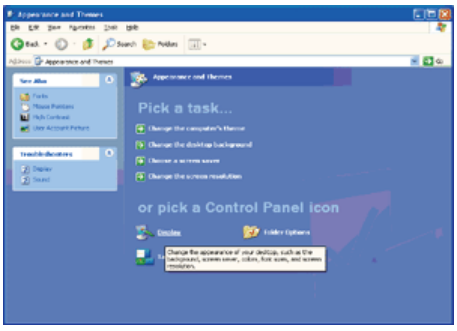


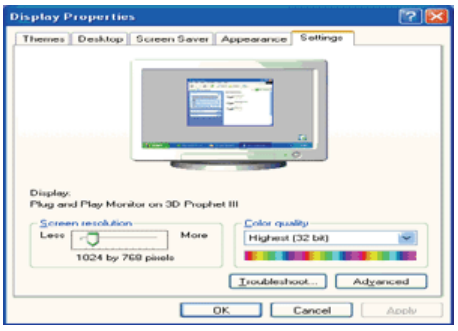
Microsoft® Windows® XP Operating System

1. Insert CD into the CD-ROM driver.
2. Click "**Start**" —> "**Control Panel**" then click the "**Appearance and Themes**" Icon.

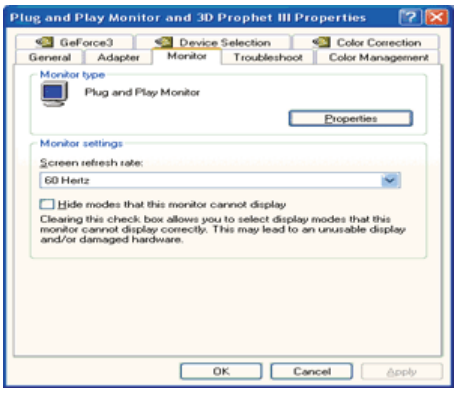


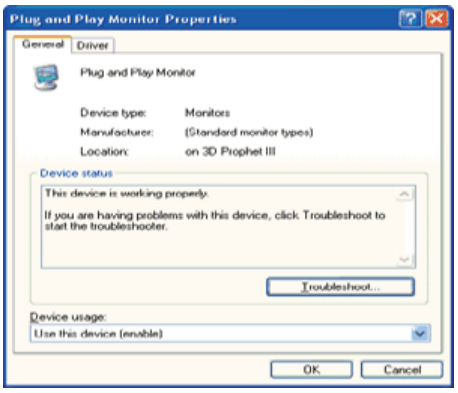
3. Click "**Display**" icon and choose the "**Settings**" tab then click "**Advanced..**".





4. Click the "**Properties**" button on the "**Monitor**" tab and select "**Driver**" tab.





5. Click "**Update Driver..**" and select "**Install from a list or..**" then click "**Next**" button.

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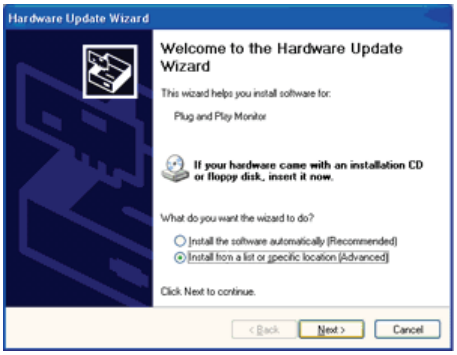
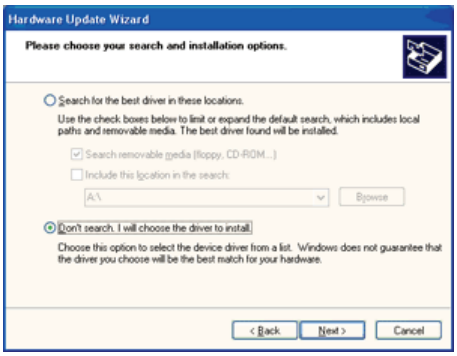
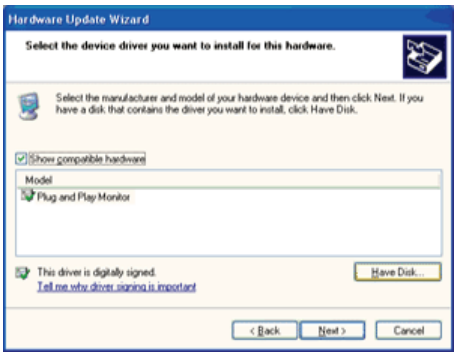
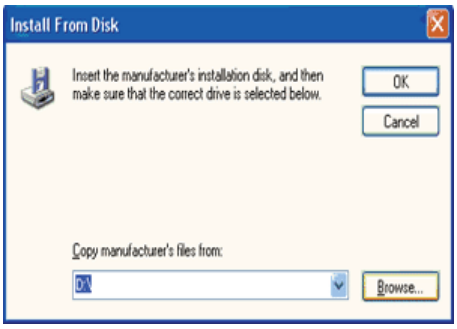
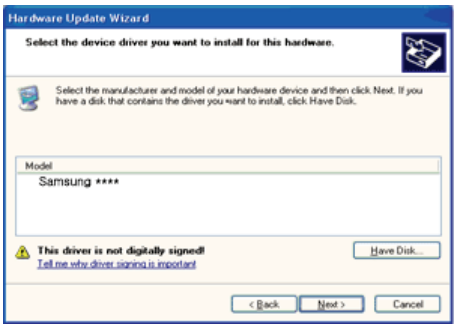

Hardware Update Wizard
Welcome to the Hardware Update Wizard
This wizard helps you install software for:
Plug and Play Monitor
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

6. Select "**Don't search ,I will..**" then click "**Next**" and then click "**Have disk**".

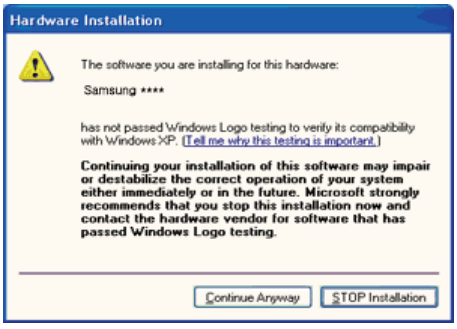

Hardware Update Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
A:\
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Hardware Update Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
Plug and Play Monitor
This driver is digitally signed.
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

7. Click the "**Browse**" button then choose A:(D:\Driver) and choose your monitor model in the model list and click the "**Next**" button.




Hardware Update Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Model
Samsung ****
This driver is not digitally signed!
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

8. If you can see following "**Message**" window, then click the "**Continue Anyway**" button. Then click "**OK**" button.


Hardware Installation
The software you are installing for this hardware:
Samsung ****
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

This monitor driver is under certified MS logo,and this installation doesn't damage your system.The certified driver will be posted on Samsung Monitor homepage.
http://www.samsung.com/

9. Click the "**Close**" button then click "**OK**" button continually.

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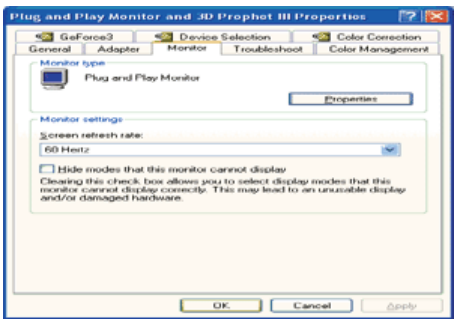

10. Monitor driver installation is completed.

Microsoft® Windows® 2000 Operating System

When you can see "Digital Signature Not Found" on your monitor, follow these steps.

1. Choose "**OK**" button on the "**Insert disk**" window.
2. Click the "**Browse**" button on the "**File Needed**" window.
3. Choose A:(D:\Driver) then click the "Open" button and then click "**OK**" button.

How to install

1. Click "**Start**" , "**Setting**" , "**Control Panel**".
2. Double click the "**Display**" Icon.
3. Choose the "**Settings**" tab and then click "**Advanced..**".
4. Choose "**Monitor**".
   Case1: If the "Properties" button is inactive, it means your monitor is properly configured. Please stop installation
   Case2: If the "Properties" button is active, click the "Properties" button then follow next steps continually.
5. Click "**Driver**" and then click on "**Update Driver..**" then click on the "Next" button.
6. Choose "**Display a list of the known drivers for this device so that I can choose a specific driver**" then click "**Next**" and then click "**Have disk**".
7. Click the "**Browse**" button then choose A:(D:\Driver).
8. Click the "**Open**" button, then click "**OK**" button.
9. Choose your monitor model and click the "**Next**" button then click "**Next**" button.
10. Click the "**Finish**" button then the "**Close**" button.

    If you can see the "**Digital Signature Not Found**" window then click the "**Yes**"button. And click the "**Finish**" button then the "**Close**" button.

Microsoft® Windows® Millennium Operating System

1. Click "**Start**" , "**Setting**" , "**Control Panel**".
2. Double click "**Display**" icon.
3. Select the "**Settings**" tab and click "**Advanced Properties**" button.
4. Select the "**Monitor**" tab.
5. Click the "**Change**" button in the "**Monitor Type**" area.
6. Choose "**Specify the location of the driver**".
7. Choose "**Display a list of all the driver in a specific location..**" then click "**Next**" button.
8. Click the "**Have Disk**" button
9. Specify A:\(D:\driver) then click "**OK**" button.
10. Select "**Show all devices**" and choose the monitor that corresponds to the one you connected to your computer and click "**OK**".
11. Continue choosing "**Close**" button and "**OK**" button until you close the Display Properties dialogue box.

Microsoft® Windows® NT Operating System

1. Click **Start**, **Settings**, **Control Panel**, and then double-click **Display** icon.
2. In Display Registration Information window, click Settings Tab and then click **All Display Modes**.
3. Select a mode that you wish to use (Resolution, Number of colors and Vertical frequency) and then click **OK**.

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4. Click **Apply** button if you see the screen working normally after clicking **Test**. If the screen is not normal, change to a different mode (lower mode of resolution, colors or frequency).

If there is no Mode at **All Display Modes**, select the level of resolution and vertical frequency by referring to the Preset Timing Modes in the user guide.

Linux Operating System

To execute X-Window, you need to make the X86Config file, which is a type of system setting file.

1. Press Enter at the first and the second screen after executing the X86Config file.
2. The third screen is for **setting your mouse**.
3. Set a mouse for your computer.
4. The next screen is for **selecting a keyboard**.
5. Set a Keyboard for your computer.
6. The next screen is for **setting your monitor**.
7. First of all, set a **horizontal frequency** for your monitor. (You can enter the frequency directly.)
8. Set a **vertical frequency** for your monitor. (You can enter the frequency directly.)
9. Enter the **model name of your monitor**. This information will not affect the actual execution of X-Window.
10. You have **finished** setting up your monitor.
    Execute X-Window after setting other requested hardware.

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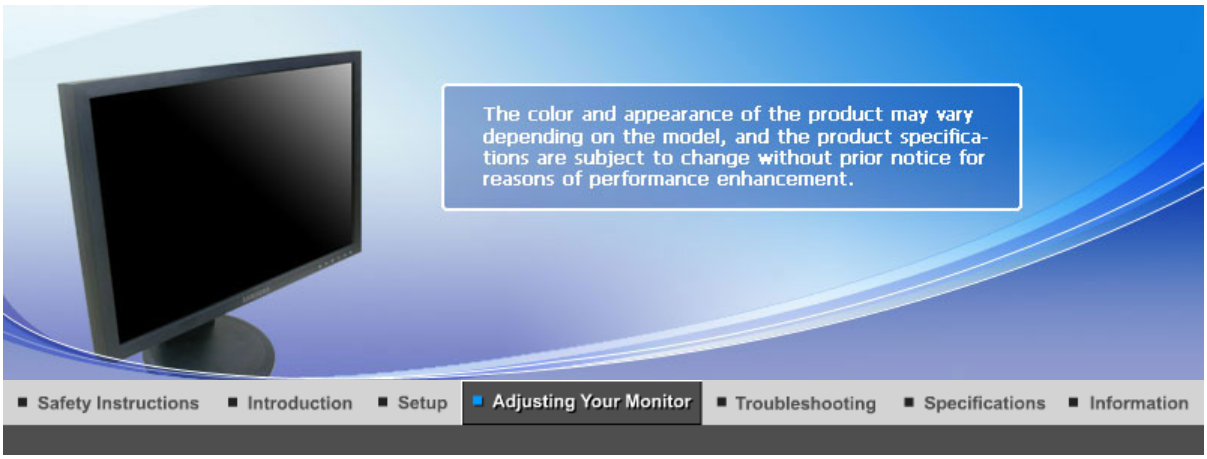
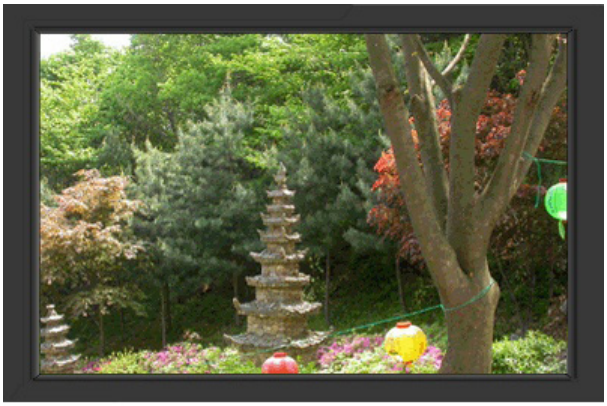

The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.



1. [MENU]Use this button to open the on-screen menu and exit from the menu screen or close screen adjustment menu.
2. [▼/▲]This button allows you to adjust items in the menu.
3. [↵]Press this button to activate a highlighted menu item.
4. [**AUTO**]Press to self-adjust to the incoming PC signal. The values of fine,coarse and position are adjusted automatically.

AUTO

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Menu	Description
AUTO	When the '**AUTO**' button is pressed, the Auto Adjustment screen appears as shown in the animated screen on the center. Auto adjustment allows the monitor to self-adjust to the incoming video signal. The values of fine, coarse and position are adjusted automatically. (Available in analog mode only) - If auto adjustment does not work properly, press AUTO button again to adjust picture with more accuracy. - If you change resolution in the control panel, auto function will be executed automatically.

Locked

Menu	Description

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Locked	After pushing the "MENU" button more than 5 seconds, OSD function is locked (unlocked). You can adjust only the brightness and contrast of the monitor with the OSD adjustment locking feature.

Customized key

Menu	Description
Customized key	You can customize key assignment for the Custom button according to your preferences. To view the operating screen displayed when pressing the [ ] button after configuring the customized key for a function, click the name of each function. (Image Size - MagicBright - MagicColor - Color Effect) You can configure the customized key for a required function via **Setup** >Customized Key

Brightness

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Menu	Description
Brightness	When OSD is not on the screen, push the button to adjust brightness.

Picture	Brightness	Contrast	MagicBright		
Color	MagicColor	Color Tone	Color Control	Color Effect	Gamma
Image	Coarse	Fine	Sharpness	H-Position	V-Position
OSD	Language	H-Position	V-Position	Transparency	Display Time
Setup	Reset	Customized Key	Off Timer	Image Size	
Information					

Picture

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Menu	Description	Play/Stop
Brightness	You can use the on-screen menus to change the brightness according to personal preference. **Direct Access Feature** : When OSD is not on the screen, push the [☼] button to adjust brightness. [MENU → ↵ → ↵ → ▲, ▼ → MENU]	
Contrast	You can use the on-screen menus to change the contrast according to personal preference. [MENU → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
MagicBright	Push the ⏏ button to circle through available preconfigured modes. MagicBright is a new feature providing optimum viewing environment depending on the contents of the image you are watching. Currently seven different modes are available: Custom, Text, Internet, Game, Sport, Movie and Dynamic Contrast. Each mode has its own pre-configured brightness value. You can easily select one of seven settings by simply pressing Customized Key control button. **1) Custom** - Although the values are carefully chosen by our engineers, the pre-configured values may not be comfortable to your eyes depending on your taste. If this is the case, adjust the brightness and contrast by using the OSD menu. **2) Text** - For documentations or works involving heavy text. **3) Internet** - For working with a mixture of images such as texts and graphics. **4) Game** - For watching motion pictures such as a game. **5) Sport** - For watching motion pictures such as a sport. **6) Movie** - For watching motion pictures such as a DVD or Video CD. [MENU → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	

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Color

Menu	Description	Play/Stop
MagicColor	MagicColor is a new technology that Samsung has exclusively developed to improve digital image and to display natural color more clearly without disturbing image quality. **1) Off** - Returns to the original mode. **2) Demo** - The screen before applying MagicColor appears on the right and the screen after applying MagicColor appears on the left. **3) Full** - Displays not only vivid natural color but also more realistic natural skin color with clearness. **4) Intelligent** - Displays vivid natural color with clearness. [MENU → ▲, ▼ → ↵ → ↵ → ▲, ▼ → ↵ → MENU]	
Color Tone	The tone of the color can be changed and one of four modes can be selected - Cool, Normal, Warm and Custom. **Cool** - Makes whites bluish. **Normal** - Keeps whites white. **Warm** - Makes whites reddish. **Custom** - Select this mode when you want to adjust the image according to your preferences. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Color Control	Adjusts individual R,G,B color balance. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Color Effect	You can change the overall mood by changing the screen colors. **Off** - This applies an achromatic color to the screen to adjust the screen effects. **Grayscale** - The default colors of black and white are displayed. **Green** - This applies the green color effect to a black and white screen. **Aqua** - Select this mode when you want to adjust the image according to your preferences.	

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	Sepia - This applies the Sepia color effect to a black and white screen. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Gamma	Gamma correction changes the luminance of the colors with intermediate luminance. • Mode 1 • Mode 2 • Mode 3 [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	

UP

Image

Menu	Description	Play/Stop
Coarse	Removes noise such as vertical stripes. Coarse adjustment may move the screen image area. You may relocate it to the center using the horizontal control menu. (Available in analog mode only) [MENU → ▲, ▼ → ↵ → ↵ → ▲, ▼ → MENU]	
Fine	Removes noise such as horizontal stripes. If the noise persists even after fine tuning, repeat it after adjusting the frequency (clock speed). (Available in analog mode only) [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Sharpness	Changes the clearance of image. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
H-Position	Changes the horizontal position of the monitor's entire display. (Available in analog mode only) [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
	Changes the vertical position of the monitor's entire display.	

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V-Position	(Available in analog mode only) [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	

OSD

Menu	Description	Play/Stop
Language	You can choose one of 9 languages. • English, Deutsch, Español, Français, Italiano, Svenska, Русский , Português , Türkçe **Note**:The language chosen affects only the language of the OSD. It has no effect on any software running on the computer. [MENU → ▲, ▼ → ↵ → ↵ → ▲, ▼ → MENU]	
H-Position	You can change the horizontal position where the OSD menu appears on your monitor. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
V-Position	You can change the vertical position where the OSD menu appears on your monitor. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Transparency	Change the transparency of the background of the OSD. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Display Time	The menu will be automatically turned off if no adjustments are made for a certain time period. You can set the amount of time the menu will wait before it is turned off. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	

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Setup

Menu	Description	Play/Stop
Reset	Reverts the product settings to factory defaults. • **No** • **Yes** [MENU → ▲, ▼ → ↵ → ↵ → ▲, ▼ → MENU]	
Customized Key	You can specify a function which will be activated when the Customized Key(⧉) is pressed. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Off Timer	The monitors will turn off automatically at the specified time. • **Off** • **On** [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	
Image Size	You can change the size of the screen displayed on your monitor. • **Auto** - The screen is displayed in accordance with the screen aspect ratio of the input signals. • **Wide** - A full screen is displayed regardless of the screen aspect ratio of the input signals. • Signals not available in the standard mode table are not supported. • If the wide screen which is the optimal resolution for the monitor is set on your PC, this function is not performed. [MENU → ▲, ▼ → ↵ → ▲, ▼ → ↵ → ▲, ▼ → MENU]	

UP

Information

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Menu	Description
Information	Shows a video source, display mode on the OSD screen. [MENU → ▲, ▼ → MENU]

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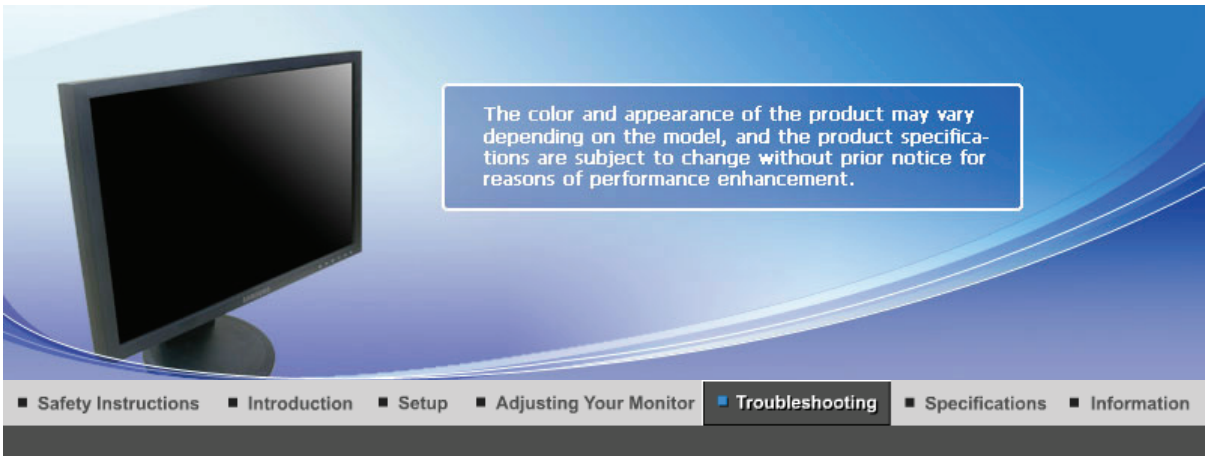
The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.

Check List

Before calling for service, check the information in this section to see if you can remedy any problems yourself. If you do need assistance, please call the phone number on the Information section or contact your dealer.

Symptom	Check List	Solutions
No images on the screen. I cannot turn on the monitor.	Is the power cord connected properly?	Check the power cord connection and supply.
	Can you see **"Check Signal Cable"** on the screen?	**(Connected using the D-sub cable)** Check the signal cable connection.
	If the power is on, reboot the computer to see the initial screen (the login screen), which can be seen.	If the initial screen (the login screen) appears, boot the computer in the applicable mode (the safe mode for Windows ME/XP/2000) and then change the frequency of the video card. (Refer to the Preset Timing Modes) Note: If the initial screen (the login screen) does not appear, contact the Service Center or your dealer.
	Can you see **"Not Optimum Mode","Recommended Mode 1440 X 900 60 Hz"** on the screen?	You can see this message when the signal from the video card exceeds the maximum resolution and frequency that the monitor can handle properly. Adjust the maximum resolution and frequency that the monitor can handle properly.
	There is no image on the screen. Is the power indicator on the monitor blinking at 1 second intervals?	The monitor is in PowerSaver mode. press a key on the keyboard to activate the monitor and restore the image on the screen.
I cannot see the On Screen Display.	Have you locked the On Screen Display (OSD) Menu to prevent changes?	Unlock the OSD by pressing the MENU button for at least 5 seconds.
The screen shows strange colors or just black and white.	Is the screen displaying only one color as if looking at the screen through a cellophane paper?	Check the signal cable connection.Make sure the video card is fully inserted in it's slot.

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	Have the screen colors become strange after running a program or due to a crash between applications?	Reboot the computer.
	Has the video card been set properly?	Set the video card by referring to the video card manual.
The screen suddenly has become unbalanced.	Have you changed the video card or the driver?	Adjust screen image position and size using the OSD.
	Have you adjusted the resolution or frequency to the monitor?	Adjust the resolution and frequency at the video card. (Refer to the Preset Timing Modes).
	The screen can be unbalanced due to the cycle of the video card signals. Readjust Position by referring to the OSD.	
The screen is out of focus or OSD cannot be adjusted.	Have you adjusted the resolution or frequency on the monitor?	Adjust the resolution and frequency of the video card. (Refer to the Preset Timing Modes).
LED is blinking but no images on the screen.	Is the frequency properly adjusted when checking the Display Timing on the menu?	Adjust the frequency properly by referring to the video card manual and the Preset Timing Modes. (The maximum frequency per resolution may differ from product to product.)
There are only 16 colors shown on the screen. The screen colors have changed after changing the video card.	Have the Windows colors been set properly?	Windows ME/2000/XP: Set the colors properly at the **Control Panel → Display → Settings**.
	Has the video card been set properly?	Set the video card by referring to the video card manual.
There is a message that reads "Unrecognized monitor, Plug & Play (VESA DDC) monitor found".	Have you installed the monitor driver?	Install the monitor driver according to the Driver Installation Instructions.
	See the video card manual to see if the Plug & Play (VESA DDC) function can be supported.	Install the monitor driver according to the Driver Installation Instructions.

Check the following items if there is trouble with the monitor.

1. Check if the power cord and the video cables are properly connected to the computer.
2. Check if the computer beeps more than 3 times when booting.
   (If it does, request an after-service for the main board of the computer.)
3. If you installed a new video card or if you assembled the PC, check if the installed the adapter (video) driver and the monitor driver.
4. Check if the scanning ratio of the video screen is set at 56 Hz ~ 60 Hz.
   (Do not exceed 60 Hz when using the maximum resolution.)
5. If you have problems in installing the adapter (video) driver, boot the computer in Safe Mode, remove the Display Adapter at the "**Control Panel → System → Device Administrator**" and then reboot the computer to reinstall the adapter (video) driver.

If problems repeatedly occur, contact an authorized service center.

Q & A

Question	Answer
How can I change the frequency?	Frequency can be changed by reconfiguring the video card. Note that video card support can vary, depending on the version

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	of the driver used. (Refer to the computer or the video card manual for details.)
How can I adjust the resolution?	Windows ME/XP/2000 : Set the resolution at the Control Panel→Display→Settings. * Contact the video card manufacturer for details.
How can I set the Power Saving function?	Windows ME/XP/2000 : Set the function at BIOS-SETUP of the computer or the screen saver. (Refer to Windows/Computer Manual).
How can I clean the outer case/LCD Panel?	Disconnect the power cord and then clean the monitor with a soft cloth, using either a cleaning solution or plain water. Do not leave any remains of the detergent nor scratch the case. Do not allow any water to go inside the monitor.

Self-Test Feature Check

Self-Test Feature Check | Warning Messages | Environment | Useful Tips

Your monitor provides a self test feature that allows you to check whether your monitor is functioning properly.

Self-Test Feature Check

1. Turn off both your computer and the monitor.
2. Unplug the video cable from the back of the computer.
3. Turn on the monitor.
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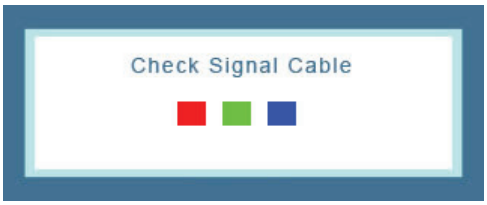
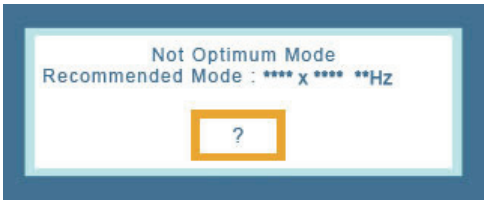


   This box appears during normal operation if the video cable becomes disconnected or damaged.

4. Turn off your monitor and reconnect the video cable; then turn on both your computer and the monitor.
   If your monitor screen remains blank after using the previous procedure, check your video controller and computer system; your monitor is functioning properly.

Warning Messages

If there is something wrong with the input signal, a message appears on the screen or the screen goes blank although the power indicator LED is still on. The message may indicate that the monitor is out of scan range or that you need to check the signal cable.



Environment

The location and the position of the monitor may influence the quality and other features of the monitor.

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1. If there are any sub woofer speakers near the monitor, unplug and relocate the woofer to another room.
2. Remove all electronic devices such as radios, fans, clocks and telephones that are within 3 feet (one meter) of the monitor.

Useful Tips

- A monitor recreates visual signals received from the computer. Therefore, if there is trouble with the computer or the video card, this can cause the monitor to become blank, have poor coloring, noise, Video mode not supported, etc. In this case, first check the source of the problem, and then contact the Service Center or your dealer.

- **Judging the monitor's working condition**
  If there is no image on the screen or a **"Not Optimum Mode","Recommended Mode 1440 X 900 60 Hz"** message comes up, disconnect the cable from the computer while the monitor is still powered on.
  - If there is a message coming up on the screen or if the screen goes white, this means the monitor is in working condition.
  - In this case, check the computer for trouble.

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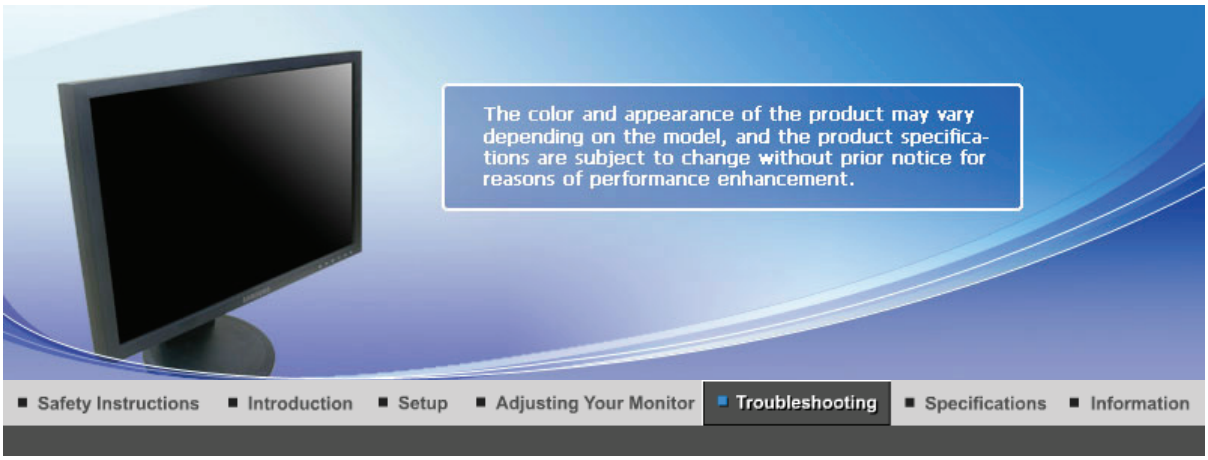
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	Can you see **"Not Optimum Mode","Recommended Mode 1680 X 1050 60 Hz"** on the screen?	You can see this message when the signal from the video card exceeds the maximum resolution and frequency that the monitor can handle properly. Adjust the maximum resolution and frequency that the monitor can handle properly.
	There is no image on the screen. Is the power indicator on the monitor blinking at 1 second intervals?	The monitor is in PowerSaver mode. press a key on the keyboard to activate the monitor and restore the image on the screen.
I cannot see the On Screen Display.	Have you locked the On Screen Display (OSD) Menu to prevent changes?	Unlock the OSD by pressing the MENU button for at least 5 seconds.
The screen shows strange colors or just black and white.	Is the screen displaying only one color as if looking at the screen through a cellophane paper?	Check the signal cable connection.Make sure the video card is fully inserted in it's slot.

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	Have the screen colors become strange after running a program or due to a crash between applications?	Reboot the computer.
	Has the video card been set properly?	Set the video card by referring to the video card manual.
The screen suddenly has become unbalanced.	Have you changed the video card or the driver?	Adjust screen image position and size using the OSD.
	Have you adjusted the resolution or frequency to the monitor?	Adjust the resolution and frequency at the video card. (Refer to the Preset Timing Modes).
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The screen is out of focus or OSD cannot be adjusted.	Have you adjusted the resolution or frequency on the monitor?	Adjust the resolution and frequency of the video card. (Refer to the Preset Timing Modes).
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4. Check if the scanning ratio of the video screen is set at 56 Hz ~ 60 Hz.
   (Do not exceed 60 Hz when using the maximum resolution.)
5. If you have problems in installing the adapter (video) driver, boot the computer in Safe Mode, remove the Display Adapter at the "**Control Panel → System → Device Administrator**" and then reboot the computer to reinstall the adapter (video) driver.

If problems repeatedly occur, contact an authorized service center.

Check List | Q & A | Self-Test Feature Check

Q & A

Question	Answer
How can I change the frequency?	Frequency can be changed by reconfiguring the video card. Note that video card support can vary, depending on the version

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	of the driver used. (Refer to the computer or the video card manual for details.)
How can I adjust the resolution?	Windows ME/XP/2000 : Set the resolution at the Control Panel→Display→Settings. * Contact the video card manufacturer for details.
How can I set the Power Saving function?	Windows ME/XP/2000 : Set the function at BIOS-SETUP of the computer or the screen saver. (Refer to Windows/Computer Manual).
How can I clean the outer case/LCD Panel?	Disconnect the power cord and then clean the monitor with a soft cloth, using either a cleaning solution or plain water. Do not leave any remains of the detergent nor scratch the case. Do not allow any water to go inside the monitor.

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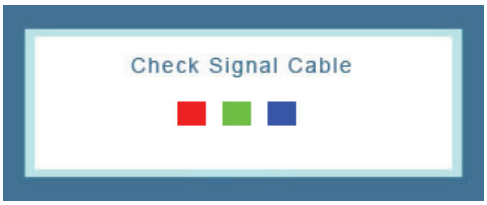

   This box appears during normal operation if the video cable becomes disconnected or damaged.

4. Turn off your monitor and reconnect the video cable; then turn on both your computer and the monitor.
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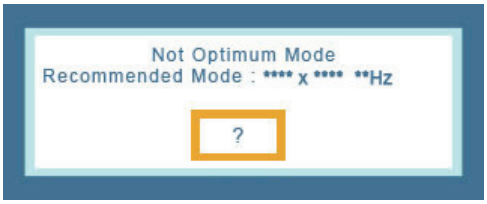
If there is something wrong with the input signal, a message appears on the screen or the screen goes blank although the power indicator LED is still on. The message may indicate that the monitor is out of scan range or that you need to check the signal cable.



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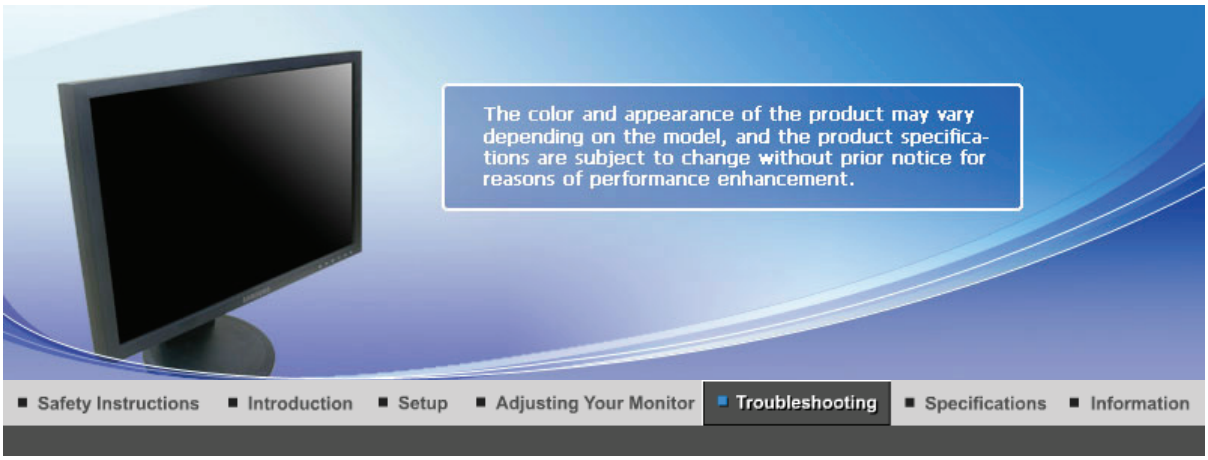
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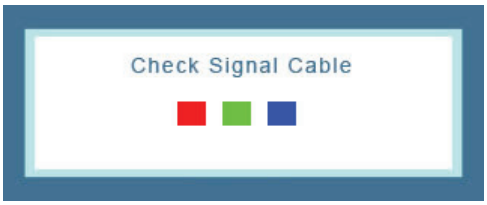

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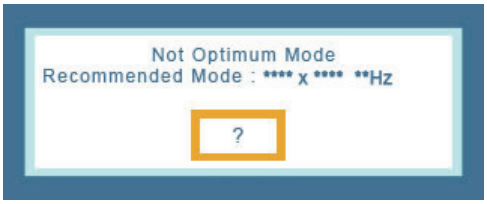

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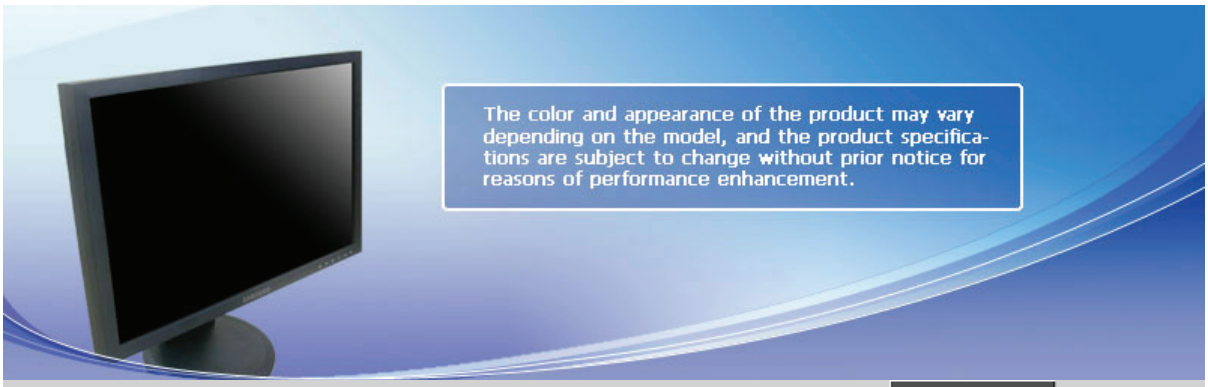
The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.

General

General	
Model Name	SyncMaster 923NW
LCD Panel	
Size	19 inch(48 cm)
Display area	408.24 mm (H) x 255.15 mm (V)
Pixel Pitch	0.2835mm (H) x 0.2835 mm (V)
Synchronization	
Horizontal	30 ~ 81 kHz
Vertical	56~75Hz
Display Color	
16.7M	
Resolution	
Optimum resolution	1440 x 900@60Hz
Maximum resolution	1440 x 900@75Hz
Input Signal, Terminated	
RGB Analog	
0.7 Vp-p ± 5 %	
Separate H/V sync, Composite, SOG	
TTL level (V high ≥ 2.0 V, V low ≤ 0.8 V)	
Maximum Pixel Clock	
137MHz	
Power Supply	
AC 100 - 240 V~ (+/- 10 %), 50/60 Hz ± 3 Hz	
Signal Cable	
15pin - to - 15pin D-sub cable, Detachable	
Dimensions (WxHxD)/ (Without Stand)	
439 x 289 x 65.5 mm(Without Stand)	

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Dimensions (WxHxD)/ Weight (With Stand)

439 x 360.2 x 199.9 mm (With Stand)/ 3.7 kg

VESA Mounting Interface

75 mm x 75 mm

Environmental considerations

Operating	Temperature : 10°C ~ 40°C (50°F ~ 104°F) Humidity : 10% ~ 80%, non-condensing
Storage	Temperature : -20°C ~ 45°C (-4°F ~ 113°F) Humidity : 5% ~ 95%, non-condensing

Plug and Play Capability

This monitor can be installed on any Plug & Play compatible system. Interaction of the monitor and computer systems will provide the best operating conditions and monitor settings. In most cases, monitor installation will proceed automatically, unless the user wishes to select alternate settings.

Dot Acceptable

TFT LCD panel manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen. This is not from bad quality and you can use it without uneasiness.

- For example, the number of TFT LCD sub pixels that is contained in this product are 3,888,000.

Note: Design and specifications are subject to change without prior notice.

Class B Equipment (Information Communication equipment for residential use)

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas.

(Class B equipment emits less electromagnetic waves than Class A equipment.)

PowerSaver

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor into a low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPMS compliant video card installed in your computer. Use a software utility installed on your computer to set up this feature.

State	Normal Operation	Power saving mode	Power off (Power button OFF) EPA/ENERGY 2000
Power Indicator	Blue	Blue Blinking	Off
Power Consumption	36 W	Less than 1 W	Less than 1 W

This monitor is EPA ENERGY STAR® compliant and ENERGY2000 compliant when used with a computer equipped with VESA DPMS functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Preset Timing Modes

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If the signal transferred from the computer is the same as the following Preset Timing Modes, the screen will be adjusted automatically. However, if the signal differs, the screen may go blank while the power LED is on. Refer to the video card manual and adjust the screen as follows.

Table 1. Preset Timing Modes

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31,469	70,086	25,175	+/-
IBM, 640 x 480	31,469	59,940	25,175	-/-
IBM, 720 x 400	31,469	70,087	28,322	-/+
MAC, 640 x 480	35,000	66,667	30,240	-/-
MAC, 832 x 624	49,726	74,551	57,284	-/-
MAC, 1152 x 870	68,681	75,062	100,000	-/-
VESA, 640 x 480	37,500	75,000	31,500	-/-
VESA, 640 x 480	37,861	72,809	31,500	-/-
VESA, 800 x 600	35,156	56,250	36,000	+/+
VESA, 800 x 600	37,879	60,317	40,000	+/+
VESA, 800 x 600	46,875	75,000	49,500	+/+
VESA, 800 x 600	48,077	72,188	50,000	+/+
VESA, 1024 x 768	48,363	60,004	65,000	-/-
VESA, 1024 x 768	56,476	70,069	75,000	-/-
VESA, 1024 x 768	60,023	75,029	78,750	+/+
VESA, 1152 x 864	67,500	75,000	108,000	+/+
VESA, 1280 x 960	60,000	60,000	108,000	+/+
VESA, 1280 x 1024	63,891	60,020	108,000	+/+
VESA, 1280 x 1024	79,976	75,025	135,00	+/+
VESA, 1440 x 900	55,935	59,887	106,500	-/+
VESA, 1440 x 900	70,635	74,984	136,750	-/+

Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle and the inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

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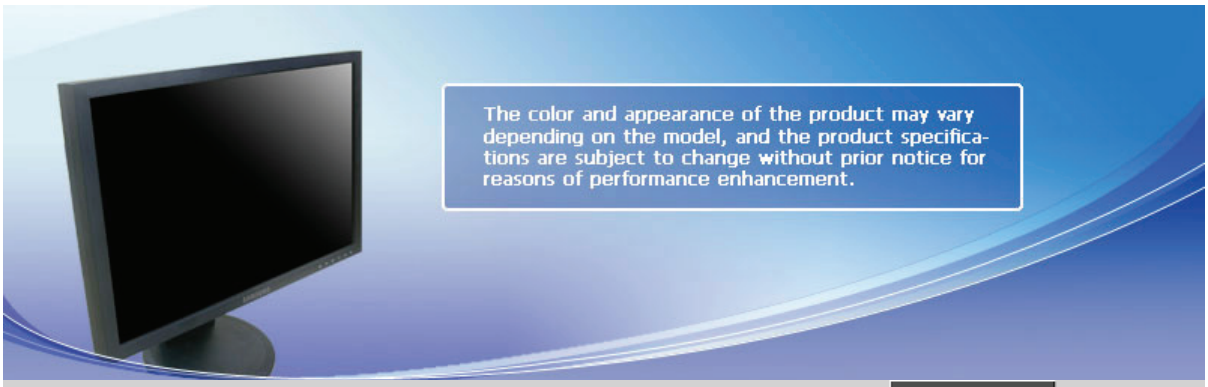
The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.

General

General	
Model Name	SyncMaster 2023NW
LCD Panel	
Size	20inch (51 cm)
Display area	433.44mm (H) x 270.9mm (V)
Pixel Pitch	0.258 mm (H) x 0.258mm (V)
Synchronization	
Horizontal	30 ~ 81 kHz
Vertical	56~75Hz
Display Color	
16.7M	
Resolution	
Optimum resolution	1680 x 1050@60Hz
Maximum resolution	1680 x 1050@60Hz
Input Signal, Terminated	
RGB Analog	
0.7 Vp-p ± 5 %	
Separate H/V sync, Composite, SOG	
TTL level (V high ≥ 2.0 V, V low ≤ 0.8 V)	
Maximum Pixel Clock	
146MHz	
Power Supply	
AC 100 - 240 V~ (+/- 10 %), 50/60 Hz ± 3 Hz	
Signal Cable	
15pin - to - 15pin D-sub cable, Detachable	
Dimensions (WxHxD)/ (Without Stand)	
471.4 x 307.9 x 69.5 mm(Without Stand)	

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Dimensions (WxHxD)/ Weight (With Stand)

471.4 x 391.1 x 217.3 mm (With Stand) / 3.8 kg

VESA Mounting Interface

100 mm x 100 mm

Environmental considerations

Operating	Temperature : 10°C ~ 40°C (50°F ~ 104°F) Humidity : 10% ~ 80%, non-condensing
Storage	Temperature : -20°C ~ 45°C (-4°F ~ 113°F) Humidity : 5% ~ 95%, non-condensing

Plug and Play Capability

This monitor can be installed on any Plug & Play compatible system. Interaction of the monitor and computer systems will provide the best operating conditions and monitor settings. In most cases, monitor installation will proceed automatically, unless the user wishes to select alternate settings.

Dot Acceptable

TFT LCD panel manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen. This is not from bad quality and you can use it without uneasiness.

- For example, the number of TFT LCD sub pixels that is contained in this product are 5,292,000.

Note: Design and specifications are subject to change without prior notice.

Class B Equipment (Information Communication equipment for residential use)

This product complies with the Electromagnetic Compatibility Directives for residential use and can be used in all areas including common residential areas.

(Class B equipment emits less electromagnetic waves than Class A equipment.)

PowerSaver

This monitor has a built-in power management system called PowerSaver. This system saves energy by switching your monitor into a low-power mode when it has not been used for a certain amount of time. The monitor automatically returns to normal operation when you press a key on the keyboard. For energy conservation, turn your monitor OFF when it is not needed, or when leaving it unattended for long periods. The PowerSaver system operates with a VESA DPMS compliant video card installed in your computer. Use a software utility installed on your computer to set up this feature.

State	Normal Operation	Power saving mode	Power off (Power button OFF) EPA/ENERGY 2000
Power Indicator	Blue	Blue Blinking	Off
Power Consumption	41 W	Less than 1 W	Less than 1 W

This monitor is EPA ENERGY STAR® compliant and ENERGY2000 compliant when used with a computer equipped with VESA DPMS functionality.

As an ENERGY STAR® Partner, SAMSUNG has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Preset Timing Modes

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Table 1. Preset Timing Modes

Display Mode	Horizontal Frequency (kHz)	Vertical Frequency (Hz)	Pixel Clock (MHz)	Sync Polarity (H/V)
IBM, 640 x 350	31,469	70,086	25,175	+/-
IBM, 640 x 480	31,469	59,940	25,175	-/-
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VESA, 640 x 480	37,500	75,000	31,500	-/-
VESA, 800 x 600	35,156	56,250	36,000	+/+
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VESA, 1152 x 864	67,500	75,000	108,000	+/+
VESA, 1280 x 960	60,000	60,000	108,000	+/+
VESA, 1280 x 1024	79,976	75,025	135,000	+/+
VESA, 1680 x 1050	64,674	59,883	119,000	+/-

Horizontal Frequency

The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle and the inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

Vertical Frequency

Like a fluorescent lamp, the screen has to repeat the same image many times per second to display an image to the user. The frequency of this repetition is called Vertical Frequency or Refresh Rate. Unit: Hz

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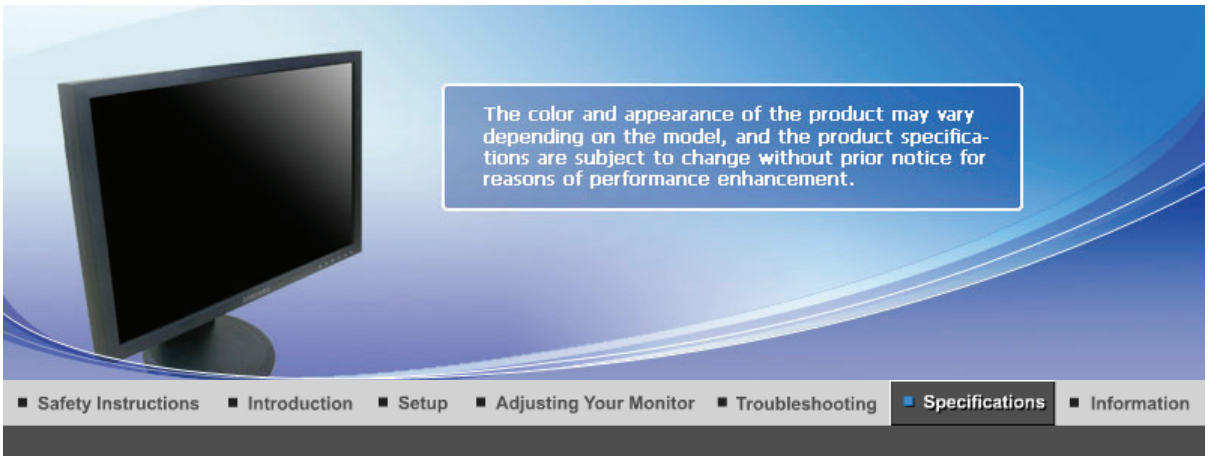
The color and appearance of the product may vary depending on the model, and the product specifications are subject to change without prior notice for reasons of performance enhancement.

General

General	
Model Name	SyncMaster 2223NW
LCD Panel	
Size	22inch
Display area	473.76mm (H) x 296.1 mm (V)
Pixel Pitch	0.282 mm (H) x 0.282 mm (V)
Synchronization	
Horizontal	30 ~ 81 kHz
Vertical	56~75Hz
Display Color	
16.7M	
Resolution	
Optimum resolution	1680 x 1050@60Hz
Maximum resolution	1680 x 1050@60Hz
Input Signal, Terminated	
RGB Analog	
0.7 Vp-p ± 5 %	
Separate H/V sync, Composite, SOG	
TTL level (V high ≥ 2.0 V, V low ≤ 0.8 V)	
Maximum Pixel Clock	
146MHz (Analog)	
Power Supply	
AC 100 - 240 V~ (+/- 10 %), 50/60 Hz ± 3 Hz	
Signal Cable	
15pin - to - 15pin D-sub cable, Detachable	
Dimensions (WxHxD)/ (Without Stand)	
511 x 335 x 66.8 mm (Without Stand)	

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Dimensions (WxHxD)/ Weight (With Stand)

511 x 417.8 x 217.3 mm (With Stand) / 4.9 kg

VESA Mounting Interface

100 mm x 100 mm

Environmental considerations

Operating	Temperature : 10°C ~ 40°C (50°F ~ 104°F) Humidity : 10% ~ 80%, non-condensing
Storage	Temperature : -20°C ~ 45°C (-4°F ~ 113°F) Humidity : 5% ~ 95%, non-condensing

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State	Normal Operation	Power saving mode	Power off (Power button OFF) EPA/ENERGY 2000
Power Indicator	Blue	Blue Blinking	Off
Power Consumption	41 W	Less than 1 W	Less than 1 W

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VESA, 1680 x 1050	64,674	59,883	119,000	+/-

Horizontal Frequency

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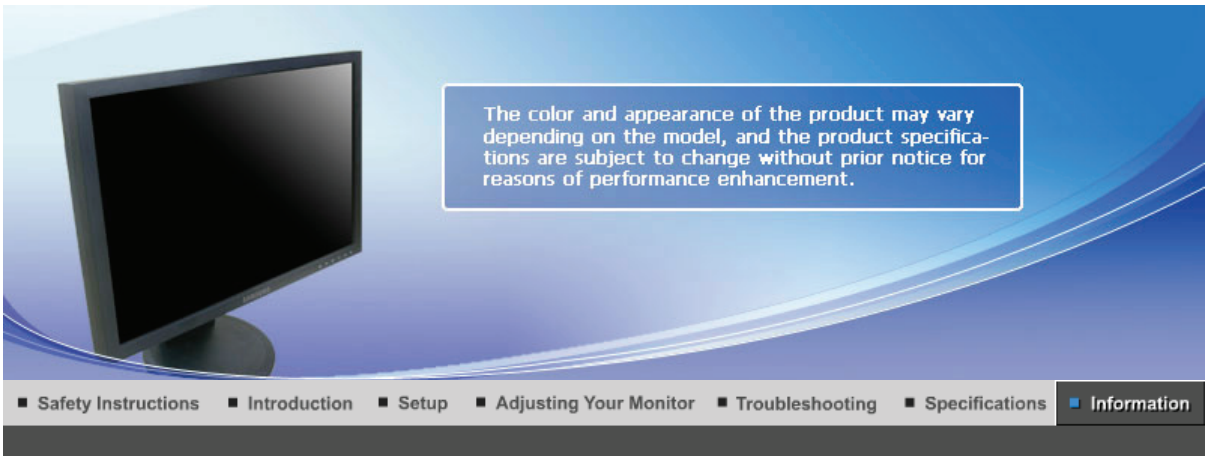
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Terms

- **Dot Pitch**
  The image on a monitor is composed of red, green and blue dots. The closer the dots, the higher the resolution. The distance between two dots of the same color is called the 'Dot Pitch'. Unit: mm

- **Vertical Frequency**
  The screen must be redrawn several times per second in order to create and display an image for the user. The frequency of this repetition per second is called Vertical Frequency or Refresh Rate. Unit: Hz

  Example :If the same light repeats itself 60 times per second, this is regarded as 60 Hz.

- **Horizontal Frequency**
  The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

- **Interlace and Non-Interlace Methods**
  Showing the horizontal lines of the screen from the top to the bottom in order is called the Non-Interlace method while showing odd lines and then even lines in turn is called the Interlace method. The Non-Interlace method is used for the majority of monitors to ensure a clear image. The Interlace method is the same as that used in TVs.

- **Plug & Play**
  This is a function that provides the best quality screen for the user by allowing the computer and the monitor to exchange information automatically. This monitor follows the international standard VESA DDC for the Plug & Play function.

- **Resolution**
  The number of horizontal and vertical dots used to compose the screen image is called 'resolution'. This number shows the accuracy of the display. High resolution is good for performing multiple tasks as more image information can be shown on the screen.

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Example :If the resolution is 1440 X 900 , this means the screen is composed of 1440 horizontal dots (horizontal resolution) and 900 vertical lines (vertical resolution).

For Better Display

1. Adjust computer resolution and screen injection rate (refresh rate) oncomputer as described below to enjoy the best quality of picture. You can have an uneven quality of picture in the screen if the best quality of picture is not provided in TFT-LCD.
    - Resolution: 1440 X 900
    - Vertical frequency (refresh rate): 60 Hz
2. TFT LCD panel manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen.
   This is not from bad quality and you can use it without uneasiness.
    - For example, the number of TFT LCD sub pixels that is contained in this product are 5,292,000.
3. When you clean the monitor and the panel outside, please apply the recommended small amount of cleaner by using soft and dry cloth and polish it. Let LCD area not to be forced but to be scrubbed out softly.
   If excessive force is applied, you can have a stain on it.
4. If you are not satisfied with the quality of the picture, you can get better quality of the picture by executing "auto adjustment function" in display screen that is appeared as window termination button is pressed.
   If there's still noise after automatic adjustment, use FINE/COARSE adjustment function.
5. If you view a fixed screen for an extended period of time, residual image or blurriness may appear.
   Change the mode to energy save or set a screensaver to move the picture when you need to be away from the monitor for an extended period of time.

Authority

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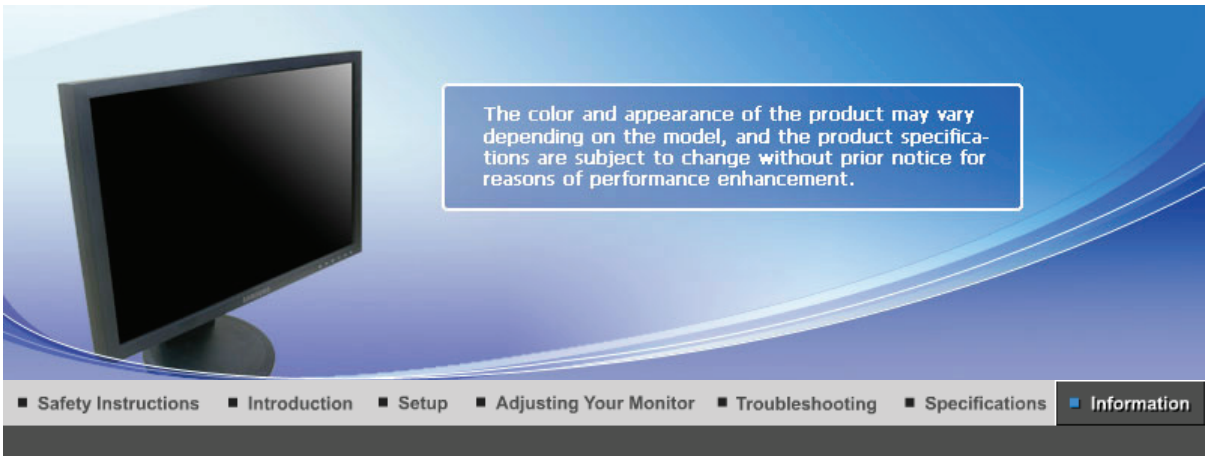
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Terms

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  The time to scan one line connecting the right edge to the left edge of the screen horizontally is called Horizontal Cycle. The inverse number of the Horizontal Cycle is called Horizontal Frequency. Unit: kHz

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Example :If the resolution is 1680 X 1050 , this means the screen is composed of 1680 horizontal dots (horizontal resolution) and 1050 vertical lines (vertical resolution).

For Better Display

1. Adjust computer resolution and screen injection rate (refresh rate) oncomputer as described below to enjoy the best quality of picture. You can have an uneven quality of picture in the screen if the best quality of picture is not provided in TFT-LCD.
   - Resolution: 1680 X 1050
   - Vertical frequency (refresh rate): 60 Hz
2. TFT LCD panel manufactured by using advanced semiconductor technology with precision of 1ppm (one millionth) above is used for this product. But the pixels of RED, GREEN, BLUE and WHITE color seem to be bright sometimes or some of black pixels could be seen.
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   If excessive force is applied, you can have a stain on it.
4. If you are not satisfied with the quality of the picture, you can get better quality of the picture by executing "auto adjustment function" in display screen that is appeared as window termination button is pressed.
   If there's still noise after automatic adjustment, use FINE/COARSE adjustment function.
5. If you view a fixed screen for an extended period of time, residual image or blurriness may appear.
   Change the mode to energy save or set a screensaver to move the picture when you need to be away from the monitor for an extended period of time.

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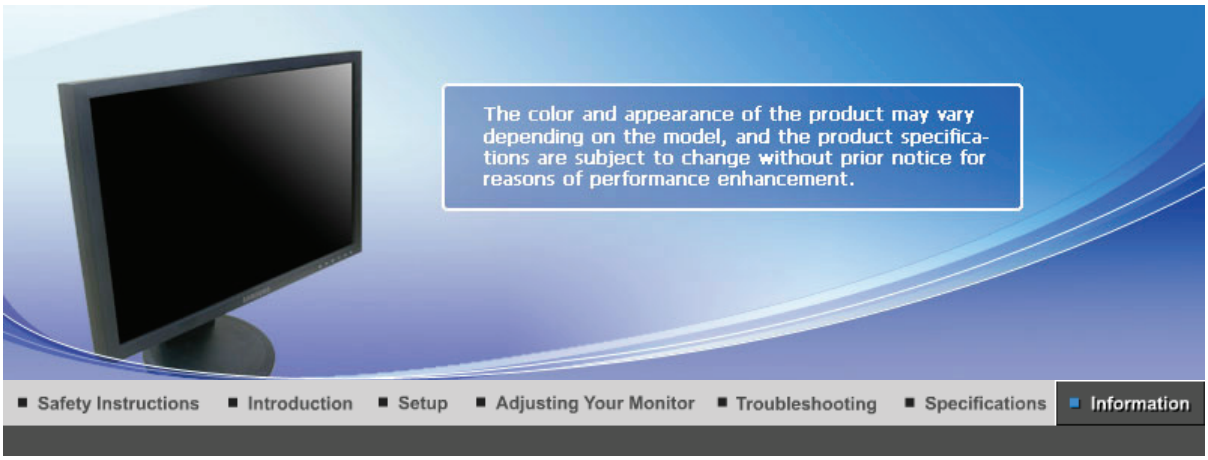
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PRODUCT INFORMATION (Image Retention Free)

LCD Monitors and TVs may have an image retention when switching from one image to another especially after displaying a stationary image for a long time.
This guide is to demonstrate a correct usage of LCD products in order to protect them from Image retention.

- **Warranty**
  Warranty does not cover any damage caused by image retention.
  Burn-in is not covered by the warranty.

- **What is Image retention ?**
  During normal operation of a LCD panel, pixel image retention doesn't occur. However, if the same image is displayed for a long time, a slight difference in electric charge accumulates between the two electrodes which encase the liquid crystal. This may cause the liquid crystal to build up in a certain areas of the display. Thus, the previous image is retained when switching to a new video image. All display products, including LCD,are subject to image retention. This is not a product defect.

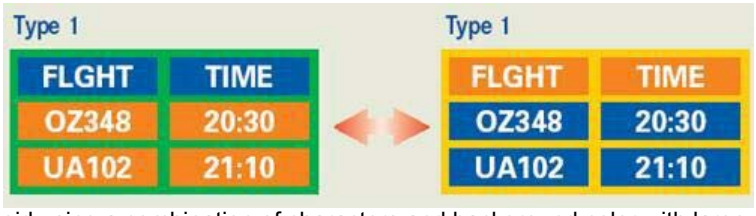
  Please follow the suggestions below to protect your LCD from image retention

- **Power Off, Screen Saver, or Power Save Mode**
  Ex)
  - Turn the power off when using a stationary pattern.
    - Turn the power off for 4 hours after 20 hours in use
    - Turn the power off for 2 hours after 12 hours in use
  - Use a Screen saver if possible
    - Screen saver in one color or a moving image is recommended.
  - Set the Monitor to power off with the PC Display Properties Power Scheme.

- **Suggestions for specific applications**
  Ex) Airports, Transit Stations, Stock Markets, Banks, and Controlling Systems
  We recommend that you follow set up of your display system program as below:

- **Display Information together with Logo or Moving image cycle.**
  Ex) Cycle : Display Information for 1 hour followed by a
  Display Logo or moving image for 1 minute.

- **Change the Color Information periodically (Use 2 different colors).**
  Ex) Rotate the Color Information with 2 colors every 30 minutes.



Avoid using a combination of characters and background color with large difference in luminance.
Avoid using Grey colors, which can cause Image retention easily.

- Avoid: Colors with big difference in luminance (Black & White, Grey)

Ex)

- Recommended settings: Bright colors with little difference in luminance

- Change the characters color and background color every 30 minutes

Ex)

- Every 30 minutes, change the characters with movement.

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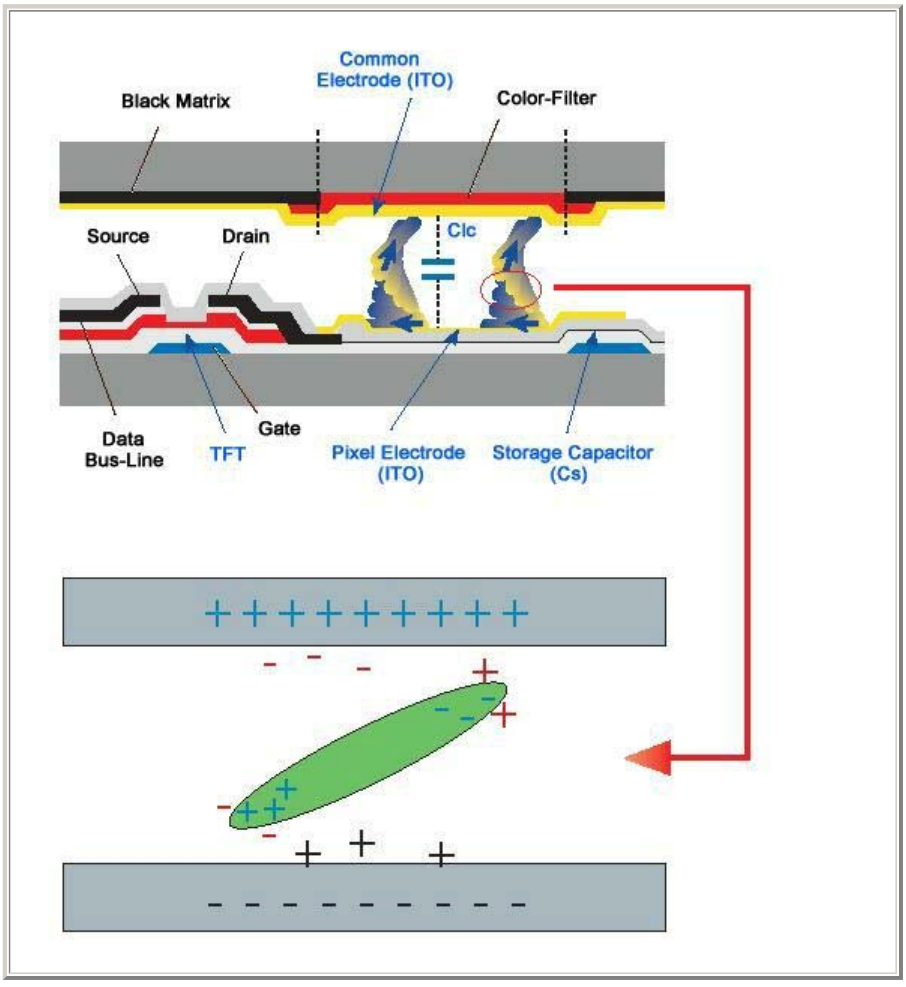
Ex)

- **The best way to protect your monitor from Image retention is to set your PC or System to operate a Screen Saver program when you are not using it.**

  Image retention may not occur when a LCD panel is operated under normal conditions.

  Normal conditions are defined as continuously changing video patterns. When the LCD panel is operated for a long time with a fixed pattern (-over 12 hours-), there may be slight difference in voltage between electrodes that work the liquid crystal (LC) in a pixel. The voltage difference between electrodes increases with time, forcing the liquid crystal to lean. When this occurs, the previous image may be seen when the pattern is changed.
  To prevent this, the accumulated voltage difference must be decreased.



- Our LCD Monitor satisfies ISO13406-2 Pixel fault Class II

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(Applicable in the European Union and other European countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.

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